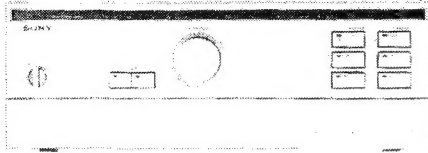


**INTEGRATED STEREO AMPLIFIER**

# TA-F70



**OPERATING INSTRUCTIONS**    page 2

Before operating the unit, please read this manual thoroughly.  
This manual should be retained for future reference.

**MODE D'EMPLOI**    page 16

Avant toute opération, lire attentivement ce mode d'emploi.  
Conserver ce manuel pour toute référence ultérieure.

**BEDIENUNGSANLEITUNG**    Seite 32

Vor Inbetriebnahme lesen Sie bitte diese Bedienungsanleitung  
sorgfältig durch.  
Bewahren Sie diese Anleitung zum späteren Nachschlagen gut auf.

The Sony TA-F70 design is based on the "true high-fidelity" concept to exclude any distortion which could degrade the tonal quality, and thus establishes a high order of performance.

The interference between the pre- and power amplifier is reduced to a minimum by a carefully designed and unique circuit layout; independently located pre- and power amplifier, each selector and unit located in the sequence of the signal path, and the shortest possible wiring so as to minimize wiring losses.

The TA-F70 features a high-gain dc power amplifier using Hi-Fi power transistors and the newly-developed Thermo Dynamic Cooling System using a heat pipe, and pulse techniques in the power supply section which provides a most efficient and stable power supply which reduces hum to a negligible low. The amplifier provides 90 watts RMS per channel into 8-ohm loads from 20 to 20,000 Hz with less than 0.007% harmonic distortion.

The TA-F70 also includes a low-noise head amplifier for moving-coil cartridges, LED PEAK POWER LEVEL indicators for each channel, a low filter in the phono signal path, and a TAPE COPY selector.

## WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

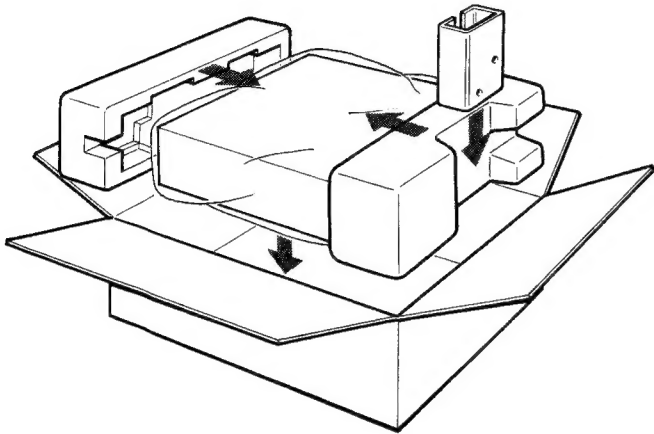
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## UNPACKING

Do not throw away the carton and the associated material: they will come in handy if you ever have to transport or ship your unit. Inspect your unit immediately after unpacking. If any sign of damage is found, consult your local Sony dealer.

When shipping the unit for repair work or to another location, the unit should be repacked in the original carton and packing material just as it was originally.



## PRECAUTIONS

### On safety

- Check that the operating voltage of your unit is identical with the voltage of your local power supply.
- Should any liquid or solid object fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Unplug the unit from the wall outlet if it is not to be used for an extended period of time. To disconnect the cord, pull it out by grasping the plug. Never pull the cord itself.

### On installation

- Do not install the unit in a location near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- Good air circulation is essential to prevent internal heat build-up in the unit. Place the unit in the location with adequate air circulation. Do not place the unit on a soft surface, such as a rug that would block the ventilation holes on the bottom.
- Do not place anything on top of the cabinet. The top ventilation holes must be unobstructed for the proper operation of the unit and to prolong the life of its components.
- The Thermo Dynamic Cooling System of this unit will be most effective when the unit is placed on a level surface. Do not operate the unit in an inclined position.

### On operation

- Before making program source connections, be sure to turn the power switch off and unplug the unit.
- Do not attempt to test the protection circuits by blocking the ventilation holes or connecting improper loads.
- When the unit is not used, turn the power off, to conserve energy and to extend the useful life of your unit.
- If any problem arises in the operation of this unit, such as no sound from the one or both channels, etc., first follow the procedures suggested in "TROUBLE CHECKS" on page 12. Most problems that arise are the result of a simple misconnection or incorrect operation and can be cleared up easily. If the difficulty still persists, contact your nearest Sony dealer.

## NOTICE FOR CUSTOMERS IN THE UNITED KINGDOM

### Important

The wires in this mains lead are coloured in accordance with following code.

Blue: Neutral

Brown: Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black. The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

## SYSTEM CONNECTIONS

### CONNECTION NOTES

● The power cord should be connected last of all, first making sure that the POWER switch is turned off.

● To assure correct matching at the input and output terminals of your audio system, refer to the "SPECIFICATIONS" on page 12, and to the specifications given in the instruction manuals provided with the components you wish to connect to the amplifier. Generally the output level of a signal source (phono cartridge, tape recorder, etc.) should be equal to or slightly greater than the sensitivity of the corresponding input. Also the output impedance of a signal source should be considerably lower than the impedance of the corresponding input.

For example, a tape recorder having an output level and impedance of 250 mV and 10 k $\Omega$  respectively can be connected to the amplifier TAPE inputs which are rated at 150 mV and 50 k $\Omega$ .

● For all program source input and output connections, use a low-capacitance type shielded cable. Keep the cables as short as practicable, avoiding horizontal runs. Excessively-long runs over 2 meters (6 feet) tend to reduce the high frequency response, while horizontal runs are susceptible to power line hum pick-up.

● When connecting program sources or tape recorders, note that the red jacks of the amplifier are for right-channel connections and the white jacks for left-channel connections.

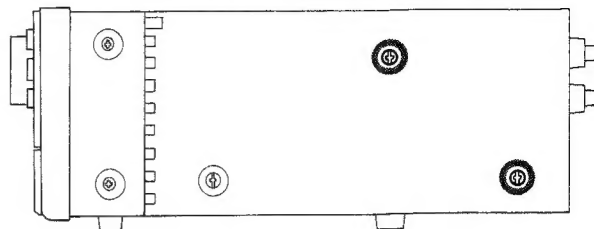
● The cable connectors should be fully inserted into the jacks. A loose connection may cause hum and noise.

● If reconnections are made, be sure to lower all source level controls and turn off the amplifier to avoid possible speaker damage.

### MOUNTING THE CORD BRACKET

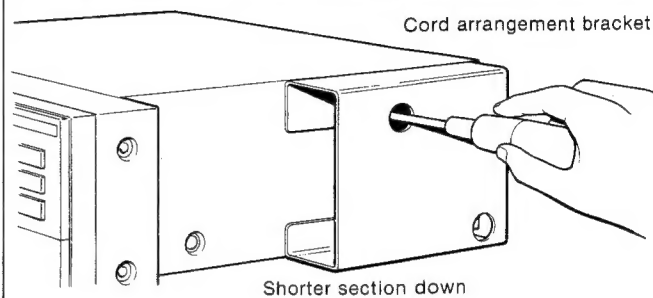
If so required, mount the supplied cord arrangement bracket as follows.

① Unfasten the two screws (circled portions in the illustration) on the right side of the amplifier using a screwdriver.



② Insert the screws into the smaller holes of the bracket.

③ Fasten the bracket to the side panel with the screws by inserting the screwdriver from the larger holes of the bracket.



Ground Terminals

PHONO 1 Inputs

PHONO 2 Inputs

TUNER Inputs

Auxiliary Inputs [AUX]

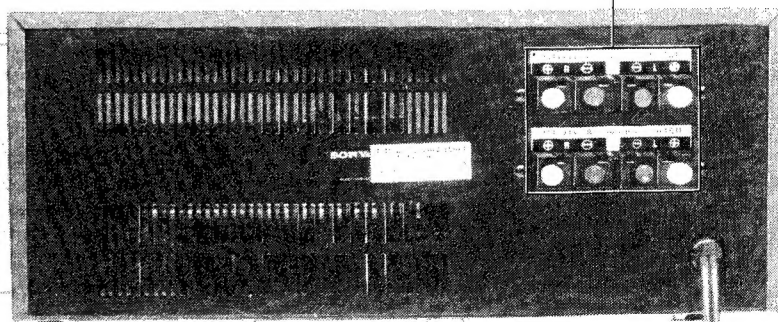
TAPE 1 Inputs

REC OUT 1 Jacks

TAPE 2 Inputs

REC OUT 2 Jacks

SPEAKER A, B Terminals



AC Power Cord

**CONNECTION DIAGRAM**  
For detailed information about connection, refer to the page in the parentheses.



## SPEAKER CONNECTION

This amplifier has provision for two pairs of speaker systems—system A and system B which can be selected individually by means of the front panel SPEAKERS selector.

### Caution

This amplifier is rated at 90 watts minimum RMS per channel with an 8-ohm load from 20 – 20,000 Hz and may deliver an instantaneous peak power much greater than the rated power. Be sure to use speakers with adequate power handling capabilities. Always reduce the volume, when setting down or removing a tonearm or when tuning an fm tuner across the band. Speaker damage may result if these precautions are not observed.

### Speaker impedance

This amplifier is designed to work best with speakers having nominal ratings from 8 to 16 ohms.

Care should be taken that the speaker impedance should not be less than the lowest indicated value (8 ohms) on the rear panel.

### Speaker cable type

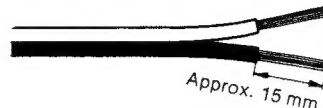
The type of wire used to connect the speakers to the amplifier is not critical in most home stereo systems.

Common 18-gauge lamp cord (the center conductor of 1 mm in diameter) is fine for short runs. However, 16-gauge (1.3 mm) to 14-gauge (1.6 mm) may be needed for long runs to prevent excessive power losses in the wiring.

## Connecting speaker cord to the amplifier

Connect each speaker to the corresponding amplifier speaker terminals i.e. right speaker to the R speaker terminals of the amplifier and left speaker to the L speaker terminals.

- 1 Strip approx. 15 mm ( $\frac{5}{8}$ "') of outer covering from the speaker cord.

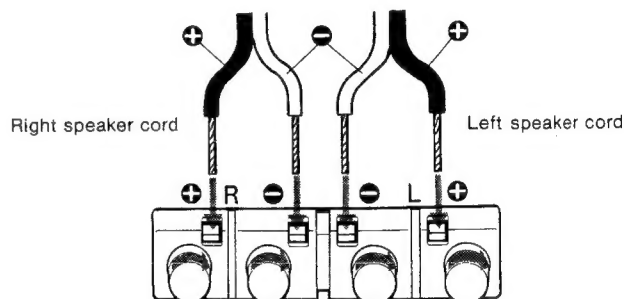


- 2 Twist the wire ends for easy insertion. Do not coat with solder.



- 3 Loosen the terminal screws and fully insert the twisted wires into the slots. Tighten the screws firmly.

Note that the colored or marked lead of a speaker cord goes to the  $\oplus$  terminal and the remaining one to the  $\ominus$  terminal, to avoid making any incorrect connections.



- 4 After these procedures are completed, pull the speaker cord lightly to see if the connection is secure.

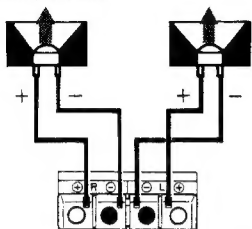
### Caution

Do not connect the speaker terminals of one channel in parallel (together) with those of the other channel.

### Speaker phasing

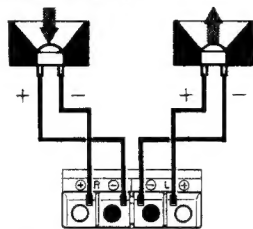
One of the most important requirements for good stereo reproduction is correct speaker phasing (all speaker cones move in the same direction when similarly energized). For correct speaker phasing, all speakers must be connected correctly i.e. all  $\oplus$  terminals of the speakers should be connected to  $\oplus$  terminals of the amplifier, and  $\ominus$  to  $\ominus$ . If one connection is reversed, all others must also be changed. Otherwise the speaker phasing becomes reversed so that the bass tones seem to be missing and the position of the instruments becomes obscure.

Proper phasing



Both speaker cones move in the same direction.

Improper phasing



The  $\oplus\ominus$  connections of right speaker are reversed, so two cones move in the opposite direction.

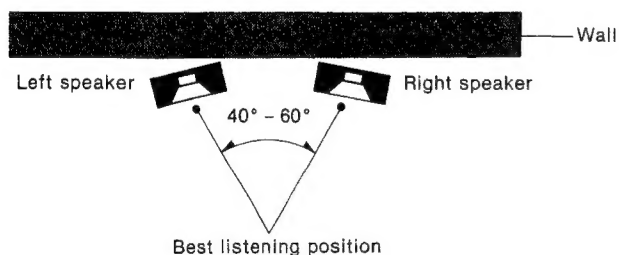
### Speaker placement

Here are a few suggestions for speaker placement that will assist you in obtaining an installation with satisfactory stereo sound.

Normally, the speakers are placed on the floor against the narrower wall of a room. The bass sounds can then be increased by moving the speakers toward the corners, or decreased by raising the speakers off the floor on suitable pedestals, and/or moving them away from the wall a moderate distance. If the speakers are positioned above the floor, do not place them higher than ear-level while seated, since this produces an unnatural effect.

The distance between speakers, or the speakers and a listener depends mainly on the room size. Generally it is recommended that the speaker/listener relationship be an equilateral triangle configuration (as illustrated).

If the speaker separation is too wide, an undesirable "hole in the middle" effect occurs.



Place the right and left speakers in similar acoustic environments, otherwise you will obtain unbalanced sound. For example, placing one speaker near an open door or archway will decrease the apparent bass from that speaker.

Best sound is usually obtained in a room with carpeting on the floor, and having heavy draperies and upholstered furniture. Since each room has its own individual acoustic characteristics, which are a function of its size, construction and furnishings, some experimentation with speaker placement is generally necessary before the correct balance of stereo image and bass response is obtained. This will be time well spent, resulting in your enjoyment of the maximum capabilities of your music system.

### PROGRAM SOURCE CONNECTIONS

#### Record player

This amplifier features two sets of phono inputs—PHONO 1 and PHONO 2. These are convenient for comparing two types of cartridges or record players.

The unit includes a head amplifier at the PHONO inputs for the use of moving-coil cartridges, which is controlled by the front panel HEAD AMP selector. This head amplifier boosts the minute cartridge output to a level suitable for a typical magnetic phono input.

Insert the shorting plugs (supplied) for muting the PHONO 1 or 2 terminals when these inputs are not in use. Never insert the shorting plugs in the REC OUT 1 and 2 jacks.

#### Tuner

Connect the tuner to the TUNER inputs.

Note that antenna installation and multipath interference problems are important factors when listening to FM broadcasts.


#### Tape recorder

The amplifier permits the connection of up to two tape recorders. For playback of a taped program, connect the tape recorder line outputs to the amplifier TAPE 1 or TAPE 2 inputs. For tape recording, connect the tape recorder line inputs to the amplifier REC OUT 1 or REC OUT 2 jacks. These are parallel connected, so that two simultaneous recordings from the same source are possible.

#### Other input sources

The AUX inputs are provided for connecting various input sources such as an additional tape deck or tuner, etc. These inputs are identical to the TAPE or TUNER inputs in sensitivity and impedance.

### GROUND CONNECTION

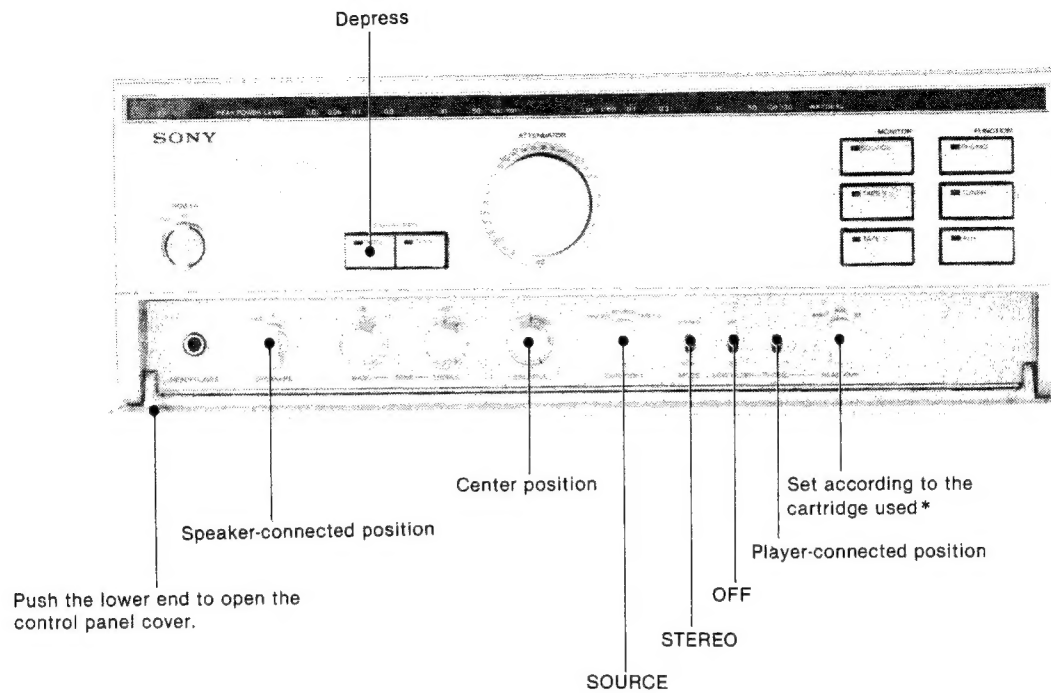
To prevent hum, be sure to connect the ground wires of the record players to the amplifier ground terminals [  ]. Two ground terminals are provided for conveniently connecting each ground wire of two record players.

If hum still exists, it may be helpful to connect the ground terminals directly to earth via ground rods.

## OPERATING INSTRUCTIONS

### INITIAL OPERATION

As a preliminary to initial operation, check that the POWER switch is turned OFF and plug the power cord into a suitable power outlet. Before proceeding to any type of operation, set the controls and switches as shown :



- \* PASS: For moving-magnet cartridges or moving-coil cartridges with output voltage more than 1 mV.  
 40  $\Omega$ : For moving-coil cartridges having an impedance of 4 ohms or more.  
 3  $\Omega$ : For moving-coil cartridges having an impedance in the 0.5 – 4 ohm range.



❶ Set the ATTENUATOR volume control at minimum position (fully counterclockwise).

❷ Set the POWER switch to ON.

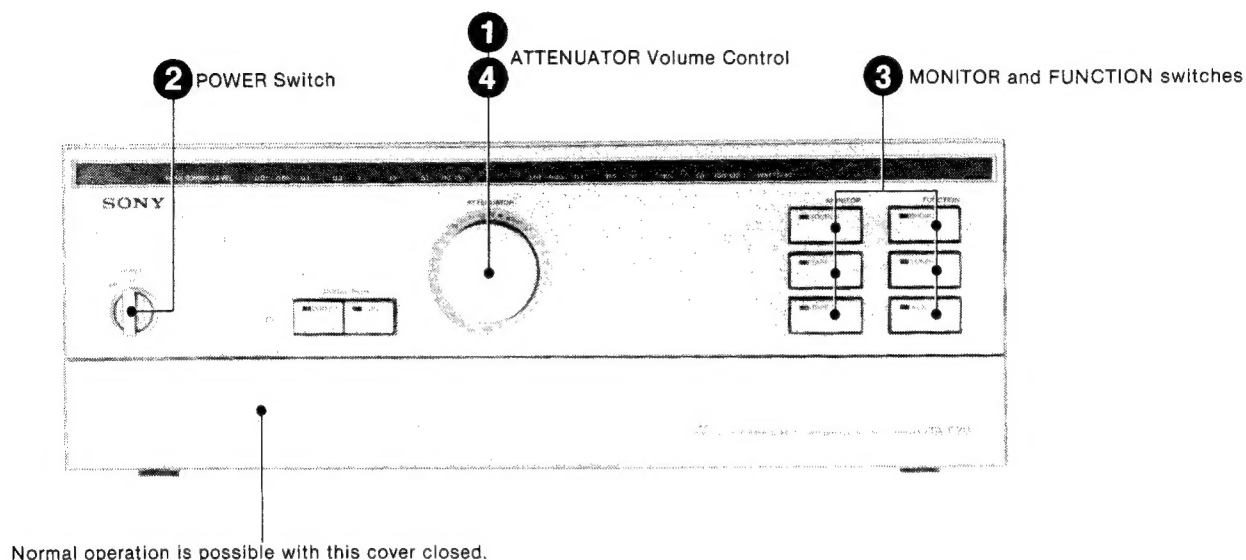
(This amplifier employs a muting circuit which provides a few seconds delay after switch-on to avoid any annoying "thump" noises when the unit is first turned on.)

❸ Select the desired program source with the MONITOR and the FUNCTION switches.

Program	MONITOR	FUNCTION
Record playing	SOURCE	PHONO
FM/AM tuner		TUNER
Auxiliary sources		AUX
Taped program	TAPE 1 or 2	Any

The light corresponding to the depressed switch will come on.

❹ Start the program and adjust the ATTENUATOR volume control to the desired level by turning it clockwise.



## SOUND ADJUSTMENTS

### Stereo balance

The feeling of direction and depth that stereophonic sound produces is greatly diminished if the levels of both channels are not balanced. Set the MODE selector to "MONO" and adjust the BALANCE control for equal output from the right and left speakers. Balance variations with different program sources are due to differences in the recording levels. Stereo balance is also influenced by the acoustics of the room. Carpets, furniture placement, and room size and shape have a definite effect upon sound quality and balance.

### Tone

Generally, the tone control circuits of an amplifier may somewhat affect the tonal response in the amplifier signal chain. To obtain an absolutely flat frequency response, depress the DIRECT switch to completely disconnect the tone control circuits from the signal path. (The LOW FILTER switch should also be set to OFF.) However, if it is necessary to compensate for any deficiency in tone quality due to the speaker system characteristics, listening room acoustics, or improperly equalized program source material, depress the TONE switch and adjust the tone with the TONE controls.

To reduce low frequency noise such as the rumble created by a turntable or warped records, use the LOW FILTER switch.

For detailed information about the controls and switches, refer to the "FRONT PANEL FACILITIES" on page 10.

## TAPE RECORDING

❶ Depress the SOURCE switch of the MONITOR switches.

❷ Select the recording program with the FUNCTION switches. For disc recording, check the settings of the PHONO input selector and HEAD AMP selector.

❸ Set the TAPE COPY selector to SOURCE.

❹ Adjust the recording level at the recorder and start it in record mode.

The ATTENUATOR, BALANCE and TONE controls have no effect upon the recording.

### Monitoring of a 3-head tape recorder

If your tape recorder has separate record and playback heads, you can monitor the recording results by depressing the TAPE 1 or TAPE 2 switch of the MONITOR switches.

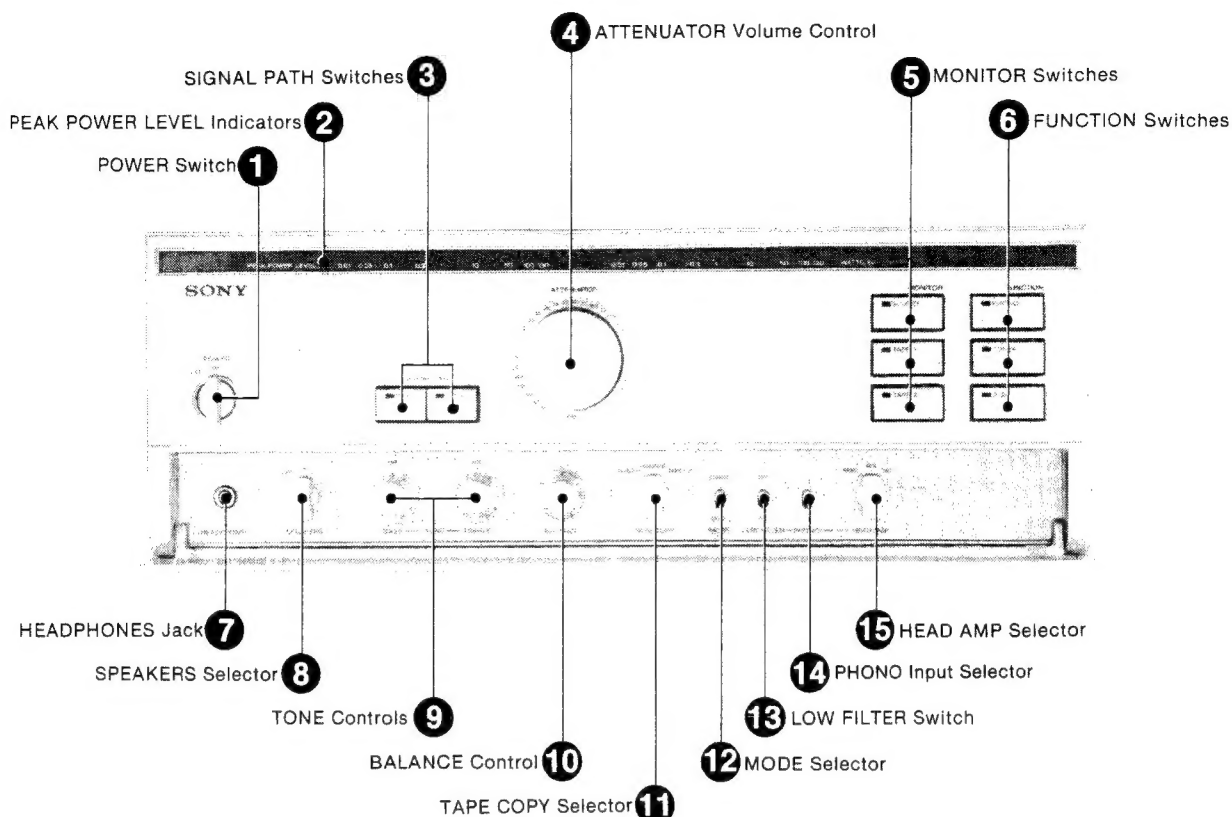
In this case, the recorder should be connected to the TAPE 1 or 2 and REC OUT 1 or 2 jacks and its tape monitor switch should be at the TAPE position.

## FRONT PANEL FACILITIES

This section describes the operation and function of each facility on the front panel of the unit.

For clarity, these are grouped into four functionally related sections.

Each number in the photo is keyed to the descriptive text.



### GENERAL CONTROL SECTION

#### ① POWER Switch

Turns the operating power on or off. The PEAK POWER LEVEL indicators will light when the amplifier is turned on.

#### ② PEAK POWER LEVEL Indicators

These two rows of LED indicators, calibrated in rms watts with 0 dB equal to 10 watts, indicate the power output of each channel of the amplifier over the range of 0.01 to 130 watts into an 8-ohm load with accurate reading of the program peaks. When connecting speakers with other than 8-ohm-impedance loads, indicator readings do not show the actual power output. For a 16-ohm speaker, multiply the indicator reading by  $\frac{1}{2}$ .

● When the POWER switch is turned on, the far left LED indicator of each channel serves as a pilot light, even without a signal present.

#### ③ SIGNAL PATH Switches

When the DIRECT switch is depressed, the bass and treble tone control circuits are completely disconnected from the signal path and an absolutely flat frequency response\* is obtained, regardless of the BASS and TREBLE control settings.

When the TONE switch is depressed, the BASS and TREBLE controls work normally.

The light corresponding to the depressed switch will then come on.

\* The response is still subject to the action of the LOW FILTER switch, and this must of course be in its OFF position for a flat response.

#### ④ ATTENUATOR Volume Control

This continuously variable attenuator controls the overall sound level.

Note that "0" indication (the fully clockwise position) means that the volume control provides zero attenuation (full gain amplification), and that "∞" indication (the fully counterclockwise position) means that the volume control provides maximum attenuation (no output).

Adjust the volume to the preferred level (the PEAK POWER LEVEL indicators are useful here).

To prevent inadvertent speaker damage, lower the volume each time you turn on or shut down the system.

#### ⑤ SPEAKERS Selector

Selects speaker system A or B.

A: To drive speaker system A.

OFF: To cut off the speaker sound or to monitor through the headphones.

B: To drive speaker system B.

#### ⑩ BALANCE Control

Governs the amount of sound coming from each paired speaker to get optimum stereo effect.

When you turn the BALANCE control to the right, the left channel volume is decreased, and vice versa.

For normal operation, set the BALANCE control to the center position.

## ⑫ MODE Selector

Determines the mode of the program produced at the speaker and headphone output.

For normal operation, set the MODE selector to STEREO.

MODE selector setting	Input	Output	Use
STEREO	L → R R → R	L R	Normal stereo sound
MONO	L → R R → R	L R	Monaural sound Speaker phasing check Stereo balance check

## INPUT SELECTION SECTION

### ⑬ MONITOR Switches

Select either the playback output from tape recorder 1 or tape recorder 2, or program sources other than the taped programs.

**SOURCE:** For such program sources as a record player, tuner, or auxiliary source.

**TAPE 1:** For playback of tape recorder 1.

**TAPE 2:** For playback of tape recorder 2.

The light corresponding to the depressed switch will come on.

### ⑭ FUNCTION Switches

Select the desired program source, other than taped programs.

**PHONO:** For disc programs (connected to PHONO 1 or 2 inputs).

**TUNER:** For off-the-air programs (connected to TUNER inputs).

**AUX:** For auxiliary programs (connected to AUX inputs).

The light corresponding to the depressed switch will come on.

### ⑮ PHONO Input Selector

Selects either the disc program from record player 1 (connected to PHONO 1 inputs) or from record player 2 (connected to PHONO 2 inputs).

### ⑯ HEAD AMP Selector

Selects the optimum position, according to the phono cartridge types used.

**PASS:** For record playing with a moving-magnet cartridge or a moving-coil cartridge with output voltage more than 1 mV).

At this position, the signal from the cartridge by-passes the head amplifier and is furnished to the equalizer amplifier directly.

**40Ω:** For record playing with a moving-coil cartridge having an impedance of 4 ohms or more. The signal from the cartridge passes through the head amplifier with its output voltage boosted and is furnished to the equalizer amplifier.

**3Ω:** For record playing with a moving-coil cartridge having an impedance in the 0.5 – 4 ohm range. The signal from the cartridge passes through the head amplifier, with its output voltage boosted, and is furnished to the equalizer amplifier.

## TONE CONTROL SECTION

### ⑰ TONE Controls

TONE controls are useful for compensating for any deficiency in your speaker system or listening room acoustics, correcting improperly equalized program source material, and so forth. They control the bass and treble response separately over a range of  $\pm 10$  dB when the TONE switch of the SIGNAL PATH switches has been depressed. They are inoperative when the DIRECT switch has been depressed.

**BASS:** Clockwise rotation boosts and counterclockwise rotation reduces bass frequencies below a turnover point of 250 Hz.

**TREBLE:** Clockwise rotation boosts and counterclockwise rotation reduces treble frequencies above a turnover point of 5 kHz.

### ⑱ LOW FILTER Switch

Set this switch to ON to reduce low frequency noise, such as the rumble created by a turntable, record changers or warped records. The filter in the phono input signal path will cut off any input signals below 15 Hz at a 12-dB-per-octave rate. This filter has no effect upon program sources other than disc programs.

If there is no need for the use of the filter, set this switch to OFF.

## FRONT PANEL TERMINAL SECTION AND ADD-ON ACCESSORY SECTION

### ⑲ HEADPHONES Jack

This jack accepts any low or high impedance stereo headphones. For headphone monitoring only, set the SPEAKERS selector to OFF.

### ⑳ TAPE COPY Selector

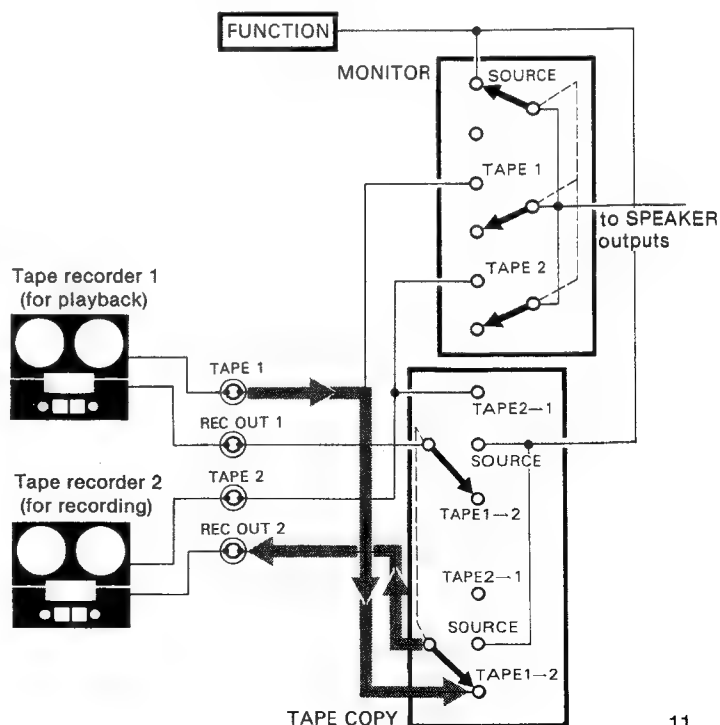
By positioning this selector to TAPE 2  $\rightarrow$  1 or TAPE 1  $\rightarrow$  2, you can dub from one tape recorder to another, while still listening to the program source you selected with the FUNCTION switches.

**TAPE 2  $\rightarrow$  1:** For dubbing from tape recorder 2 (for playback) to tape recorder 1 (for recording).

**SOURCE:** For normal use.

**TAPE 1  $\rightarrow$  2:** For dubbing from tape recorder 1 (for playback) to tape recorder 2 (for recording).

For normal operation, keep this selector at SOURCE position.



## CARE OF YOUR AMPLIFIER

### TROUBLE CHECKS

The following chart will help correct most troubles which may occur with the unit. If the trouble persists after you have made these checks, consult your Sony dealer.

Before going through the check list of specified troubles below, first refer back to the "CONNECTION DIAGRAM" on page 5 and "INITIAL OPERATION" on page 8.

#### No audio and the PEAK POWER LEVEL indicators not lit

- Check that the ac power cord is plugged into a working outlet.

#### No audio but the PEAK POWER LEVEL indicators light

- Check speaker and program source connections.
- Check the settings of the MONITOR and FUNCTION switches.
- Check the SPEAKERS selector setting.
- Turn up the volume.

#### Abrupt loss of sound from one or both of the speakers\*

- Check the speaker terminals or speaker cord for a short.
- Check for a connected audio component which might generate a dc content that affects the amplifier.
- Remove any object on the top of the cabinet which might prevent normal air circulation.

#### No TONE control adjustment

- Depress the TONE switch of the SIGNAL PATH switches.

#### No tape recording

- Check that the TAPE COPY selector is set at SOURCE.

#### No tape copying

- Check the TAPE COPY selector to see if it is correctly set.

#### Reversed left and right sound

- Check the speaker cord connection and speaker location.

#### Lack of bass sound or obscure instrument position

- Check the speaker connection for proper phasing.

#### Severe hum or noise

- Use shielded connecting cords.
- Keep the connecting cords away from transformers or motors and at least 3 meters from TV sets and fluorescent lights.
- Ground the amplifier.

#### Rustling noise

- Make secure connections.
- Wipe the plugs and jacks with a cloth lightly dampened with methanol.

#### An intermittent mechanical noise is slightly audible after the unit has been run at high volume levels

- This condition is inherent in the heat-pipe design and is not a problem.

\*This symptom may be caused when the protection circuits activate.

### CLEANING

Clean the cabinet, panel and knobs periodically with a soft cloth. If finger prints, food and beverage stains, etc. are difficult to remove, use a cloth moistened with a mild detergent solution. Do not use any type of scouring powder, abrasive pad or solvent, since these will damage the cabinet.

## SPECIFICATIONS

### Amplifier section

Continuous RMS power output

(Less than 0.007% THD, both channels driven simultaneously)  
At 1 kHz  
90 + 90 watts (8 ohms)  
At 20 Hz – 20 kHz  
90 + 90 watts (8 ohms)  
According to DIN 45500  
90 + 90 watts (8 ohms)

Power bandwidth (IHF)

5 Hz – 30 kHz

Harmonic distortion  
Less than 0.007% at rated output  
Less than 0.003% at 10 W output

Intermodulation (IM) distortion

(60 Hz : 7 kHz = 4 : 1)  
Less than 0.007% at rated output  
Less than 0.003% at 10 W output

Frequency response  
PHONO 1, 2 RIAA equalization curve  
±0.2 dB

TUNER

AUX

TAPE 1, 2

DC – 100 kHz  $\pm 0$  dB

Residual noise

Less than 100  $\mu$ V (8 ohms, Network A)

Damping factor

100 (8 ohms, 1 kHz)

### Inputs

	Sensitivity	Impedance	Maximum input capability (0.007% distortion, 1 kHz)	S/N (weighting network, input level)
PHONO 1, 2 (PASS)	2.5 mV	50 k ohms	300 mV	88 dB (A, 2.5 mV)
(40 $\Omega$ )	0.125 mV	100 ohms	15 mV	78 dB (A, 0.25 mV)
(3 $\Omega$ )	0.125 mV	33 ohms	15 mV	78 dB (A, 0.25 mV)
TUNER AUX TAPE 1, 2	150 mV	50 k ohms	—	105 dB (A, 150 mV)

### Outputs

REC OUT 1, 2

Voltage 150 mV

Impedance 4.7 k ohms

SPEAKER A, B

Accepts speakers of 8 – 16 ohms.

HEADPHONES

Accepts low and high impedance headphones.

### Tone controls

BASS

±10 dB at 25 Hz (turnover frequency 250 Hz)

TREBLE

±10 dB at 50 kHz (turnover frequency 5 kHz)

### Low filter

12 dB/octave attenuation below 15 Hz  
(operative only for phono input signals)

### General

#### System

Preamplifier section: low-noise head amp; direct-coupled, NF type equalizer amp; CR type tone control  
Power amplifier section: pure-complementary SEPP dc power amplifier with all stages direct coupled  
Power supply section: pulse-power supply circuitry; two regulated power supplies (for head amp and preamp)

#### Semiconductors

6 ICs, 6 FETs, 78 transistors, 56 diodes

#### Power requirements

European model:

220 V ac, 50/60 Hz

United Kingdom model:

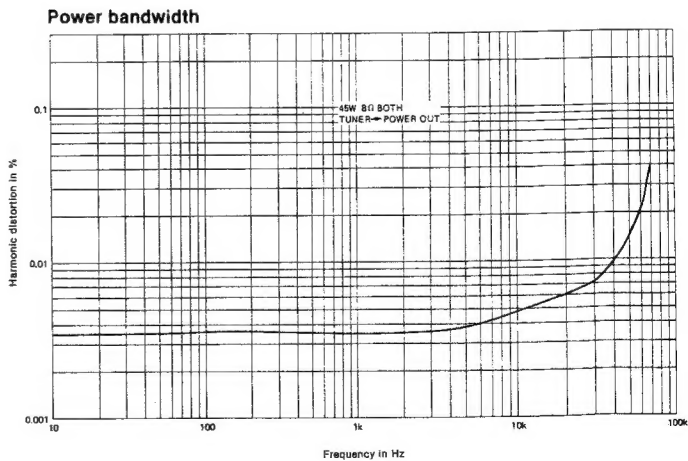
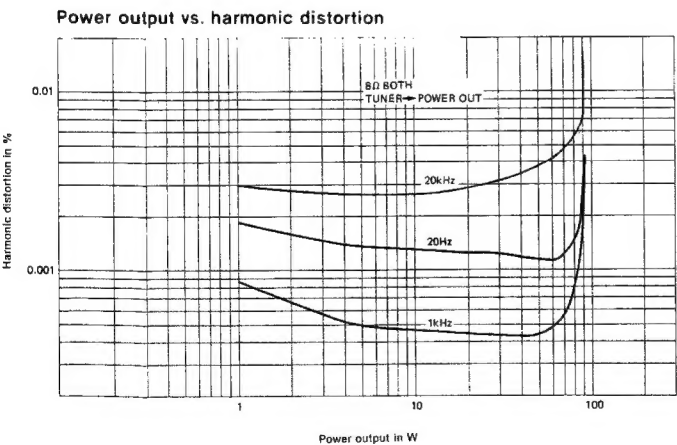
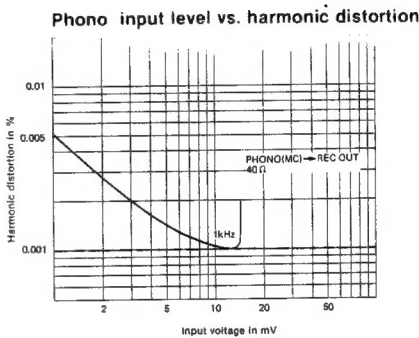
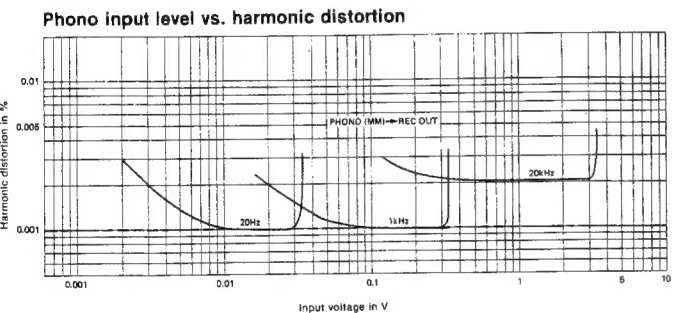
240 V ac, 50/60 Hz

Power consumption	European model : 370 W UK model : 420 W
Dimensions	Approx. 430 × 160 × 410 mm (w/h/d) (17 × 6 <sup>3</sup> / <sub>8</sub> × 16 <sup>1</sup> / <sub>4</sub> inches) including projecting parts and controls
Weight	Approx. 8.7 kg (19 lb 3 oz) net Approx. 10.5 kg (23 lb 3 oz) in shipping carton
Supplied accessories	Shorting plug (2)

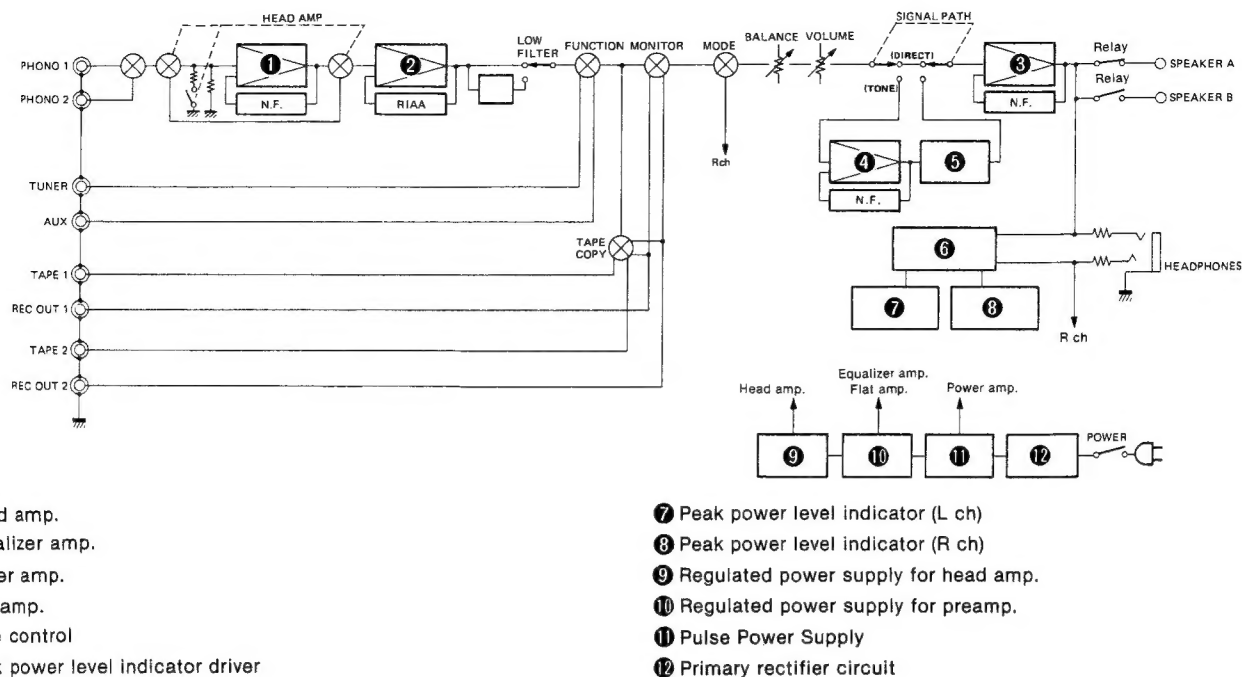
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### OPERATING CURVES



## BLOCK DIAGRAM AND CIRCUIT DESCRIPTIONS



### Internal construction and layout

The preamplifier and power amplifier sections are separated by a shield which helps in reducing any interference between those amplifiers. Input jacks are mounted directly on a printed circuit board located close to the front panel, where the switches and selectors are placed in the sequence of the signal flow. This internal construction provides a short signal path, keeping the wiring losses at a minimum.

### Head amplifier

This head amplifier includes a first stage low noise transistor differential amplifier, followed by a dual operational amplifier with a before-NFB gain of 90 dB or more, which in turn develops a before-NFB gain of 110 dB for the head amplifier. This allows a large amount of negative feedback which ensures a stable performance for the head amplifier. The equivalent input noise level of the head amplifier is a very low -150 dBV. An input impedance of 3 ohms or 40 ohms can be selected with the HEAD AMP selector.

### Equalizer amplifier

The equalizer amplifier includes a first stage direct-coupled FET differential amplifier, followed by two differential amplifiers in a cascode connection and a pure-complementary SEPP, thus forming a three-stage NF equalizer amplifier with low distortion. The equalizer amplifier also includes a feedback circuit with an RC (resistors and capacitors) network. Precision components are employed to produce an accurate RIAA playback curve, and to assure stable operation.

### Tone control section

The TA-F70 employs a CR type tone control and a flat amplifier using a low noise IC. In the tone control circuit, a polypropylene film capacitor is utilized to improve the sound quality. This tone control section including a flat amplifier is disconnected from the signal path when the DIRECT switch is depressed.

### Power amplifier section

The power amplifier includes the first stage direct-coupled dual-FET differential amplifier, the second stage low-noise transistor differential amplifier, the driver differential amplifier in a cascode connection with a current-mirror-output circuit, followed by a pure-complementary emitter follower.

The final stage employs Hi- $\beta$  power transistors with excellent linearity, forming an SEPP.

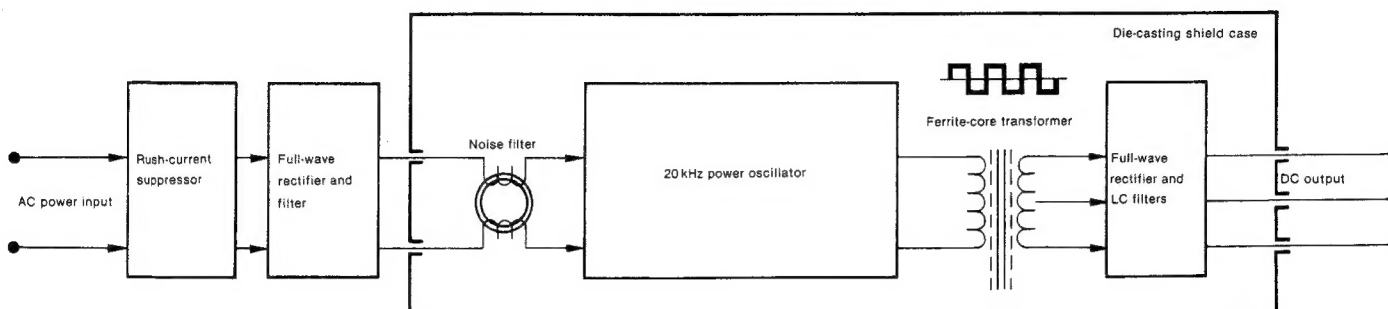
The TA-F70 also employs the newly-developed Thermo Dynamic Cooling System using a heat pipe which enables the Hi- $\beta$  power transistors to be located directly on the printed circuit board. Thus the power transistors whose electromagnetic fields could affect the tonal quality are located far from the preamplifier section which operates with very low level signals.

Owing to these circuit refinements, the TA-F70 forms a superb dc power amplifier with excellent performance, providing low distortion and a high gain of 45 dB, which enables direct drive of the power amplifier from the volume control, even with the tone control section disconnected.

### Pulse Power Supply

This amplifier employs the pulse technique in its power supply section. The circuit layout is illustrated below.

The use of this innovative power supply system provides a high-efficiency, lightweight power supply, offering a highly regulated power source under all conditions of signal input or line voltage fluctuation.



### Protection circuit and muting

In a direct-coupled output design, the speaker system is series-connected to the output transistors.

This might lead to speaker or output transistor damage if an excessive dc voltage appears at the speaker terminals, or a speaker short or output transistor failure occurs.

Protection against such occurrences is provided by the use of speaker and power transistor protection circuits. Also, the amplifier employs a temperature protection circuit which detects the heat sink temperature and protects the unit from the effect of any unusual temperature rise.

The actual operation of the speaker and temperature protection circuits is through the speaker relay.

Normally, the speaker selector remotely controls this relay for the selection of either of two speaker systems.

The muting circuit also activates this relay which provides several seconds delay after switch-on to avoid any annoying "thump" noises when the unit is first turned on.